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ABSTRACT

This report summarizes the attitudinal portion of a nation-wide survey on the computerization of Canadian universities. Six different questionnaires, each of which contained the same questions on attitudes, were mailed to faculty, deans, admissions, officers, registrars, computer center directors, and other administrators at 63 Canadian universities. The overall return rate for the survey was 28.6%, thus restricting the conclusions that can be drawn from the results. Questions on the 30-item survey were grouped according to instruction, administration, equity, and social impact. Independent variables that were explored included the size of the university, the level of education, and the age of the respondent. Results of the survey showed that, within the university, there were few significant differences in attitudes between variable groups. Overall, there was a positive feeling about computers within the university which cut across all groups. There were differences, however, in the level of positive attitudes among the subjects, with the strongest differences in attitudes occurring between the faculty and the administrative staff. There was a strong tendency for senior administrators to be the most enthusiastic of all, while the faculty were more circumspect about the changes to teaching that the computer will supposedly bring. Data are presented in five tables and four figures as well as a narrative report. The appendices contain a copy of the attitude survey questions, and a table showing the breakdown of the attitude survey data by question. (DB)

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TECHNICAL PAPER #4

ATTITUDES TOWARDS COMPUTERIZATION IN CANADIAN UNIVERSITIES

by
Renée Misfeldt
William A. Stahl

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ABSTRACT

This report summarizes the attitudinal portion of a nation-wide survey on the computerization of Canadian universities. The results of the survey show that within the university, there are few significant differences in attitudes between variable groups. Overall, there is a positive feeling about computers within the university which cuts across all groups. There are differences, however, in the level of positive attitudes among the subjects. The strongest differences in attitudes occur between the faculty and the administrative staff. There is a strong tendency for senior administrators to be the most enthusiastic of all. The faculty are more circumspect about the changes to teaching that the computer will supposedly bring.

The rapid growth of computers has been cause for both concern and anticipation. There has been considerable speculation on the importance of computers and the changes that they will or will not bring. Within the university, some have claimed that increasing computerization will create fundamental changes within higher education. Indeed, though changes to the relatively conservative structure of the university are not new, computerization could have a conspicuous effect upon the ways in which information is organized and utilized and could increase the efficiency of administrative systems. These technical changes also bring with them assumptions of interpersonal change, and with it changes to the social organization of higher education. Computers mean changes to communication, work habits, and the distribution of resources (Kiesler and Sproull, 1988: 28).

The acceptance of computers into the university is thus of considerable importance. If there is no enthusiasm for the computer, then the changes taking place within the university could be viewed as adversity instead of prosperity. While there has been considerable research into the effects of computerization upon student attitudes and performance (eg. Clarke & Chambers, 1989; Lips & Temple, 1990; Malaney & Thurman, 1989; Miura, 1987; Temple & Lips, 1989), little has been published on other members of the university. This paper will investigate attitudes towards computers held by Canadian university faculty and administration.

METHODS

The data used here is part of a Canada-wide survey on university computerization conducted in the autumn of 1989. Six different questionnaires (for faculty, deans, admissions officers, registrars, computer centre directors, and other administrators), each of which included the same questions on attitudes, were mailed to a stratified random sample of sixty-three Canadian universities. The overall rate of return for the survey was 28.6%. There were three hundred and forty responses to the attitude portion of the survey. The relatively low response rate, particularly among faculty and computer centre directors, means that we must be cautious in making generalizations. It is quite possible that, through selective response rates, computer enthusiasts are over-represented.

A thirty-question, 5-point Likert scale was used to determine attitudes (see appendix I). The questions can be grouped into four categories: pedagogy, administration, equity, and social impact. Independent variables that were explored include the size of the university, level of education, and the age of the respondent. Gender, while very important, was inadvertently left off of the coversheet. Therefore, it is not a variable under consideration here. The level of differences in attitudes were ascertained through analysis of variance (ANOVA) and t-tests of significance as well as the Chi-Square measure of association, using the SPSS-X statistical package. Having a positive attitude about computers means that one supports claims about the positive impact of the computer with pedagogical and social concerns.

FINDINGS

The results of the survey show that within the university, there are few significant differences in attitudes between variable groups. Overall, there is a positive feeling about computers within the university which cuts across all variable groups (Table 1). There are differences, however, in the level of positive attitudes among the subjects.

The most important differences in attitudes are between administrators and faculty. Administrators display significantly more positive attitudes towards computerization than do faculty members, especially with regards to pedagogical change (Fig. I). Differences on questions of administrative computing, equity issues, and the social impact of computers are less pronounced (Table 2). Administrators are more willing to agree that the computer could be beneficial to the teaching process, believing that computers could lay the foundation for education, individualize instruction, motivate students, increase creativity, and help weaker students. The more senior the administrator, the wider the gap becomes. Two questions are particularly indicative of this split. Over 46% of senior administrators strongly agree that "computers can help to achieve a higher quality of learning", only 14% of faculty do (Fig. II). Only 7.7% of senior administrators disagree with the idea that "computers will bring about a pedagogical revolution in higher education" (none of them strongly) while 44% of faculty disagree or strongly disagree with the notion (Fig. III).

Within the administrative sector of the university, there were no significant differences between the registrars, deans and student counsellors, admissions officers, computer centre directors, and other administration. Without exception, all administrative staff are positive about the implementation of computerization. It is interesting to note, however, that senior administrators differ rather sharply with everyone else on whether "those with power in the university make all major decisions about computers" (Fig.IV).

Overall, few significant differences exist among the academic staff. However, there are some faculties that disagree with the others about the impact of the computer in the university, although the small number of respondents in any given category requires our generalizations to be quite tentative (Table 3). The faculties of engineering and administration stand out as being the most positive about computers. The faculty of engineering is not as wary of the social impact and equity issues surrounding computers. Indeed, they are not as willing to say that computers will widen the gap between rich and poor students, lead to job losses, are expensive toys, are not gender neutral and are

surrounded by politics. There is less of a pattern to the differences between the faculty of administration and the other faculties. Faculty of administration members differ somewhat on issues of pedagogy, social impact, administration and equity issues. For example, they are more willing to agree that computers make administration jobs easier, are gender neutral, do not lead to job losses, are not expensive toys, and lead to a higher quality of learning. The least positive is the faculty of fine arts, who seem to be more reluctant to be positive about computers than all other faculty members, especially about the social impact of computers. The faculties of the natural sciences, the social sciences, medicine, mathematics, computer science, education, and humanities do not differ significantly in their attitudes.

The post-secondary educational level of the respondent is a factor in attitudes about computers. There are some significant differences in attitudes between faculty and staff with different academic degrees (Table 4). Those with doctorates have less positive attitudes about computers, especially the pedagogical changes that the computer is touted to bring. For example, those with doctorates are less likely than the rest to agree that the computer will bring a pedagogical change, will help weaker students, will increase productivity, will lead to a higher quality of learning, will individualize instruction, or will lay the foundation of education. This is very possibly due to the fact that faculty members are more likely to have doctorates than the administrative staff.

The size of the university is less of a factor. There are only a few significant differences, with those in smaller universities displaying more positive attitudes (Table 5). Using analysis of variance, we found that there are differences between small, medium and large universities concerning the computer's role in increasing productivity, individualizing instruction, motivating students, helping weaker students, reducing differences in university quality, bringing about a pedagogical revolution, improving university administration, being gender neutral, and making administration jobs easier. The most significant differences occur in the area of pedagogy, such as the usefulness of computers

in increasing productivity, individualizing instruction, motivating students, and helping weaker students, with the strongest association found between smaller universities and positive attitudes regarding pedagogy.

Age is not a factor in attitudes about computers. We did not find statistically significant differences between age groups.

DISCUSSION

Attitude surveys reveal peoples' opinions but tell us little about causation. Such is the case here. The strongest differences in attitudes occur between the faculty and the administrative staff. There is a strong tendency for senior administrators to be the most enthusiastic of all. Yet we are left to speculate why administrators are more computer-positive than the faculty. It is perhaps due to the effects of the computer on the different types of work that administration and faculty do. The computer potentially makes the management of the university more efficient. Both the faculty and administrative staff had positive attitudes about the administrative uses of computers. Where there were disagreements were in the area of pedagogical change.

Indeed, it is the faculty that are more circumspect about the changes to teaching that the computer will supposedly bring. The computerization of the classroom has long been the subject of debate. On the one hand are those that see the computer as an added boon to teaching, while others are more suspicious of the computer's place within the educational setting. This being the case, it is evident that while faculty members are generally positive about the impact of computers in education, they are still somewhat guarded in their enthusiasm. Administrators, perhaps because of their distance from the classroom, show no such hesitation.

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Table 1

ATTITUDE SURVEY								
			MEAN SCORES					
QUESTION	ALL FACULTY	ALL ADMIN	DEANS	ADMISSIONS	REGISTRARS	COM. CENTRE	OTHER ADMIN	ALL CANADA
#1	3.70	4.33	4.21	4.47	4.45	3.91	4.46	3.95
#2	3.59	4.04	3.97	3.74	4.16	3.73	4.35	3.77
#3	3.51	3.95	4.08	3.74	3.97	3.73	4.00	3.68
#4	2.75	2.96	3.16	2.84	2.76	2.64	3.12	2.83
#5	3.26	3.48	3.45	3.44	3.50	3.09	3.68	3.34
#6	2.44	2.57	2.62	2.32	2.63	2.46	2.64	2.49
#7	3.25	3.56	3.57	3.37	3.57	3.55	3.68	3.37
#8 (-)	2.31	2.02	1.95	2.21	2.00	2.00	2.04	2.20
#9 (-)	2.59	2.55	2.40	2.79	2.52	2.46	2.69	2.58
#10	2.34	2.57	2.50	2.47	2.67	2.27	2.73	2.44
#11 (-)	3.26	3.19	3.00	2.95	3.14	3.82	3.42	3.23
#12 (-)	3.26	3.36	3.32	3.11	3.42	3.91	3.31	3.30
#13	2.66	3.27	3.05	3.17	3.40	3.27	3.50	2.91
#14 (-)	2.09	1.69	1.79	1.90	1.60	1.64	1.54	1.93
#15	3.18	3.34	3.59	3.05	3.33	3.46	3.15	3.24
#16	3.55	4.26	4.13	4.47	4.38	4.00	4.27	3.83
#17	2.64	3.03	3.05	3.26	3.00	2.82	2.96	2.79
#18	3.31	3.46	3.50	3.22	3.32	3.82	3.56	3.37
#19 (-)	2.56	2.39	2.58	2.32	2.52	2.18	2.12	2.50
#20	3.02	3.30	3.16	3.39	3.41	2.91	3.46	3.12
#21 (-)	2.83	3.11	3.21	2.79	3.21	3.09	3.08	2.94
#22 (-)	3.09	3.09	3.11	2.79	3.23	3.46	2.96	3.09
#23 (-)	2.21	2.07	1.92	1.79	2.43	2.09	2.08	2.16
#24 (-)	1.98	2.22	2.37	2.26	2.10	1.90	2.23	2.08
#25	3.48	3.70	3.74	4.11	3.63	3.18	3.65	3.58
#26 (-)	2.35	2.19	2.40	2.21	2.13	2.09	2.00	2.29
#27	2.89	2.88	2.95	2.84	2.93	2.27	3.00	2.89
#28 (-)	2.13	2.11	2.16	2.00	2.27	2.09	1.96	2.13
#29 (-)	2.88	2.95	3.08	3.00	3.07	3.09	2.54	2.92
#30 (-)	2.45	2.26	2.11	2.61	2.38	2.18	2.15	2.38
	N= 185	N= 126	N= 39	N= 19	N= 31	N= 11	N= 26	N= 310
(-) = "Disagree" means a favourable attitude towards computerization								

Figure I

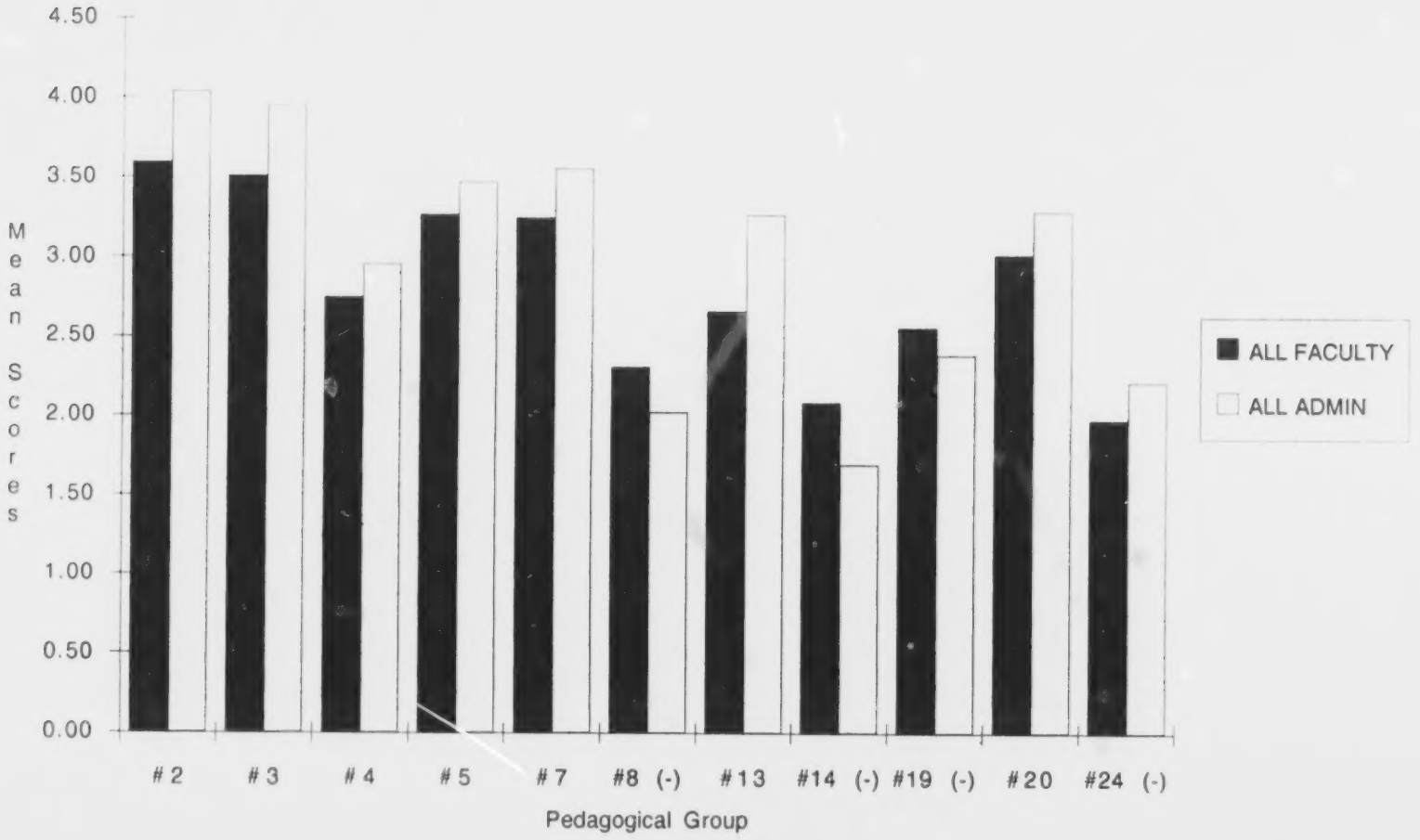

4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Mean Scores
#2
#3
#4
#5
#7
#8 (-)
#13
#14 (-)
#19 (-)
#20
#24 (-)
Pedagogical Group
ALL FACULTY
ALL ADMIN

Table 2

PEDAGOGICAL GROUP

Mean Scores

QUESTION	ALL FACULTY	ALL ADMIN	DEANS	ADMISSIONS	REGISTRARS	COM. CENTRE	OTHER ADMIN
#2	3.59	4.04	3.97	3.74	4.16	3.73	4.35
#3	3.51	3.95	4.08	3.74	3.97	3.73	4.00
#4	2.75	2.96	3.16	2.84	2.76	2.64	3.12
#5	3.26	3.48	3.45	3.44	3.50	3.09	3.68
#7	3.25	3.56	3.57	3.37	3.57	3.55	3.68
#8 (-)	2.31	2.02	1.95	2.21	2.00	2.00	2.04
#13	2.66	3.27	3.05	3.17	3.40	3.27	3.50
#14 (-)	2.09	1.69	1.79	1.90	1.60	1.64	1.54
#19 (-)	2.56	2.39	2.58	2.32	2.52	2.18	2.12
#20	3.02	3.30	3.16	3.39	3.41	2.91	3.46
#24 (-)	1.98	2.22	2.37	2.26	2.10	1.90	2.23

ADMINISTRATIVE GROUP

Mean Scores

QUESTION	ALL FACULTY	ALL ADMIN	DEANS	ADMISSIONS	REGISTRARS	COM. CENTRE	OTHER ADMIN
#1	3.70	4.33	4.21	4.47	4.45	3.91	4.46
#11 (-)	3.26	3.19	3.00	2.95	3.14	3.82	3.42
#16	3.55	4.26	4.13	4.47	4.38	4.00	4.27
#25	3.48	3.70	3.74	4.11	3.63	3.18	3.65
#26 (-)	2.35	2.19	2.40	2.21	2.13	2.09	2.00
#29 (-)	2.88	2.95	3.08	3.00	3.07	3.09	2.54

EQUITY GROUP

Mean Scores

QUESTION	ALL FACULTY	ALL ADMIN	DEANS	ADMISSIONS	REGISTRARS	COM. CENTRE	OTHER ADMIN
#9 (-)	2.59	2.55	2.40	2.79	2.52	2.46	2.69
#10	2.34	2.57	2.50	2.47	2.67	2.27	2.73
#12 (-)	3.26	3.36	3.32	3.11	3.42	3.91	3.31
#17	2.64	3.03	3.05	3.26	3.00	2.82	2.96
#18	3.31	3.46	3.50	3.22	3.32	3.82	3.56
#22 (-)	3.09	3.09	3.11	2.79	3.23	3.46	2.96
#28 (-)	2.13	2.11	2.16	2.00	2.27	2.09	1.96

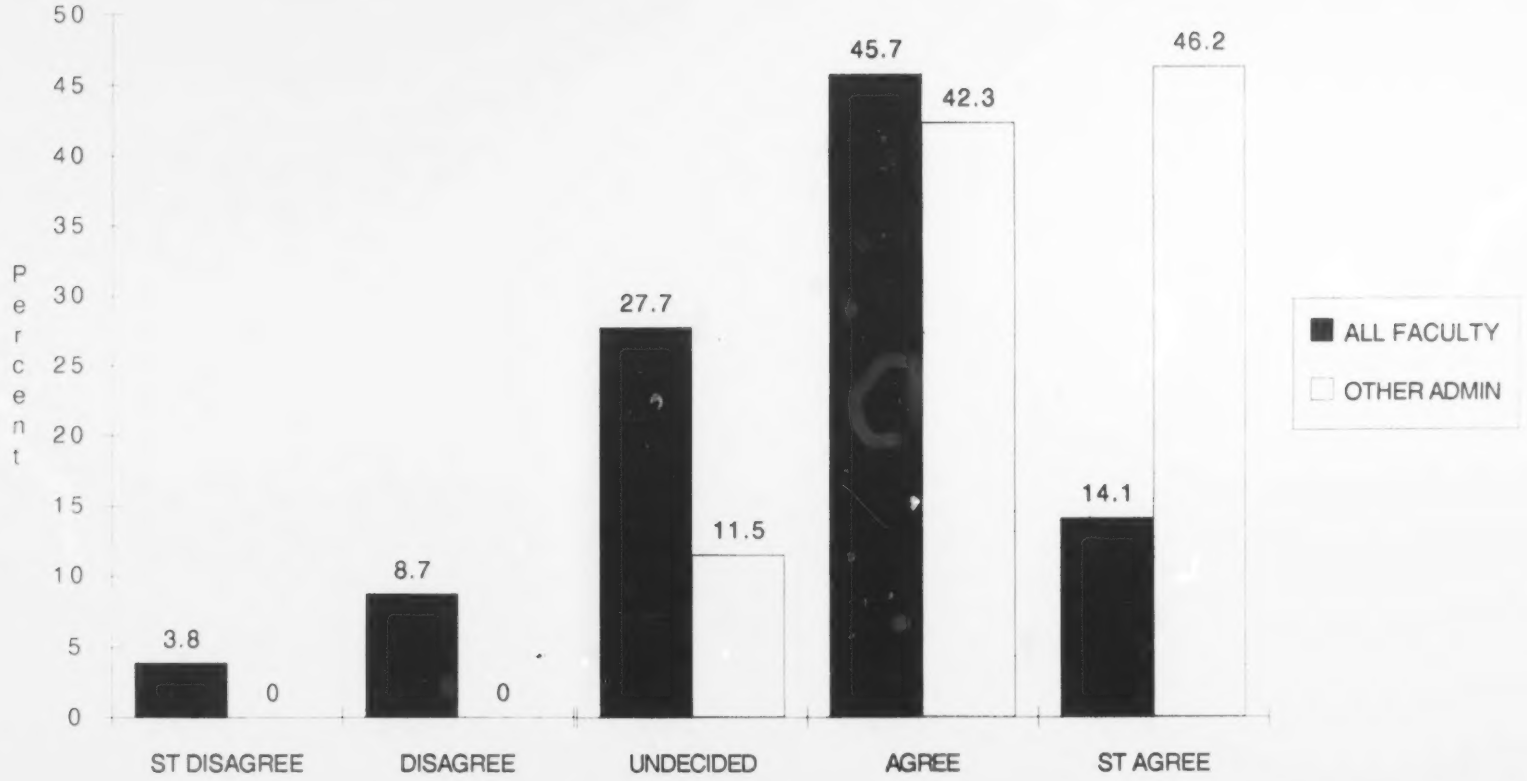
SOCIAL IMPACT GROUP

Mean Scores

QUESTION	ALL FACULTY	ALL ADMIN	DEANS	ADMISSIONS	REGISTRARS	COM. CENTRE	OTHER ADMIN
#6	2.44	2.57	2.62	2.32	2.63	2.46	2.64
#15	3.18	3.34	3.59	3.05	3.33	3.46	3.15
#21 (-)	2.83	3.11	3.21	2.79	3.21	3.09	3.08
#27	2.89	2.88	2.95	2.84	2.93	2.27	3.00
#30 (-)	2.45	2.26	2.11	2.61	2.38	2.18	2.15

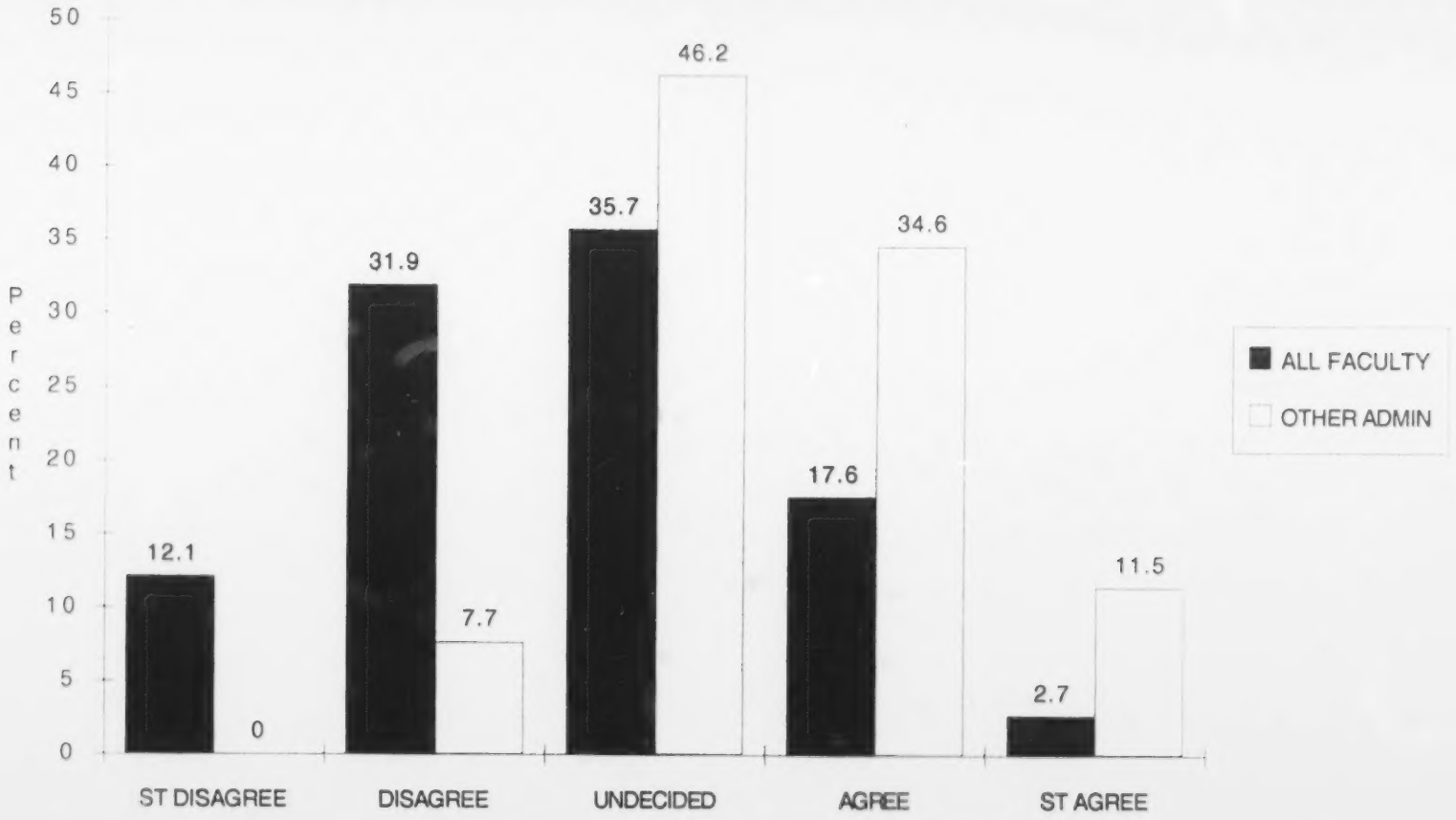
(-) = "Disagree" means a favourable attitude towards computerization

Figure II



#2 Computers can help to achieve a higher quality of learning.

Figure III



#13 Computers will bring about a pedagogical revolution in higher education.

Figure IV

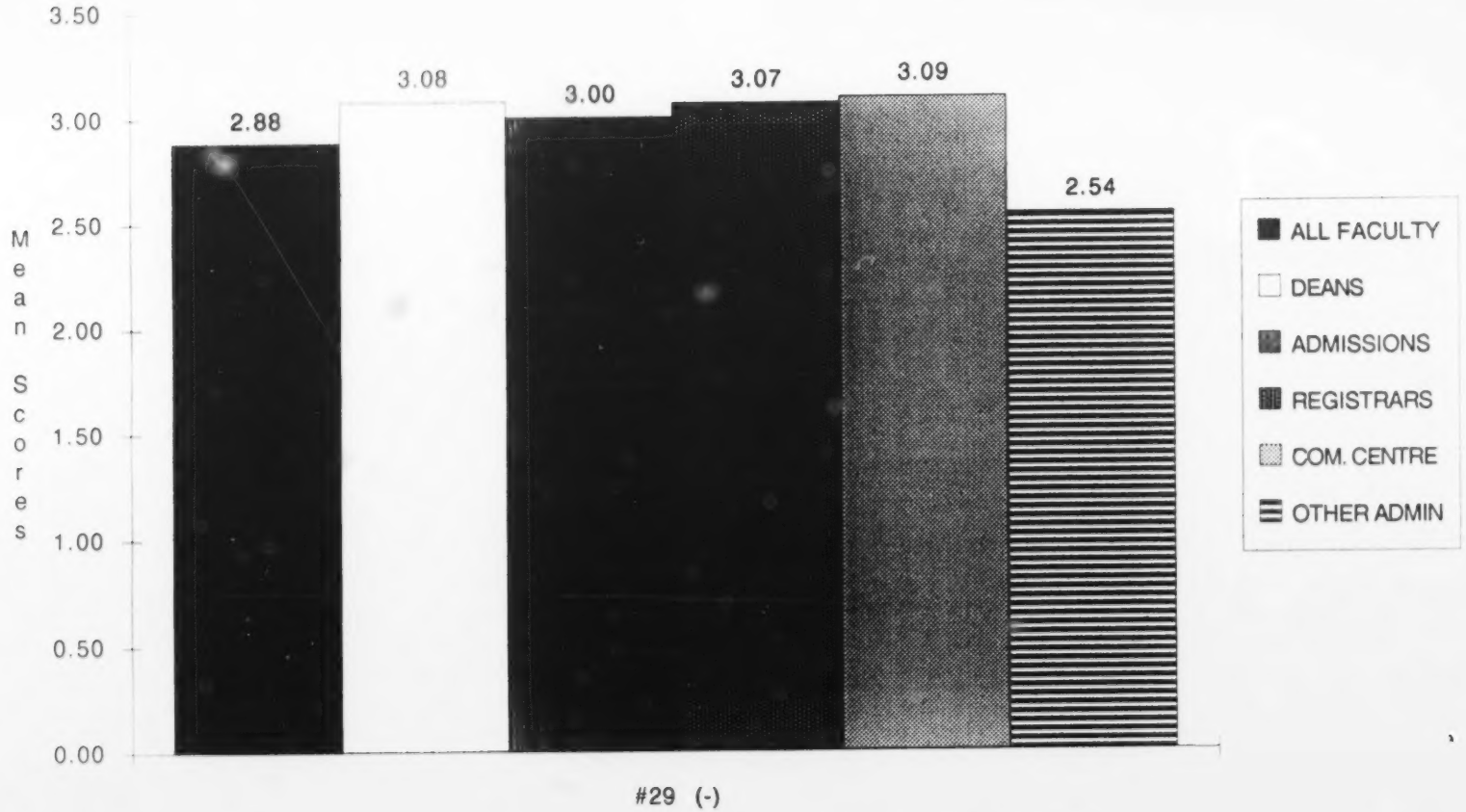

3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Mean Scores
2.88
3.08
3.00
3.07
3.09
2.54
ALL FACULTY
DEANS
ADMISSIONS
REGISTRARS
COM. CENTRE
OTHER ADMIN
#29 (-)
Those with power in the university make all major decisions about computers.

Table 3

FACULTY BY UNIT Mean Scores										
QUESTION	ALL FAC	FINE ARTS	HUM	SOC. SCI	NAT SCI	MATH	ADMIN	EDUC	ENG	MED
# 1	3.69	3.29	4.15	3.78	3.83	3.29	3.91	4.00	3.74	3.58
# 2	3.58	2.71	3.64	3.43	3.57	3.71	3.91	4.10	4.00	3.58
# 3	3.49	3.14	3.50	3.25	3.65	3.14	3.73	3.80	3.47	3.54
# 4	2.74	2.71	2.79	2.43	2.91	1.86	2.73	3.50	2.89	2.79
# 5	3.25	3.14	3.67	2.83	3.57	3.57	3.36	3.80	3.00	3.08
# 6	2.43	2.29	2.60	2.23	2.50	2.43	2.00	3.10	2.68	2.54
# 7	3.24	3.29	3.64	3.22	3.14	3.29	3.00	3.80	2.95	3.33
#8 (-)	2.32	2.86	2.14	2.09	2.41	2.29	2.09	2.10	2.58	2.38
#9 (-)	2.60	2.57	2.57	2.54	2.50	2.86	3.09	2.90	2.53	2.79
# 10	2.35	2.43	1.79	2.17	2.64	2.00	2.45	2.60	2.42	2.54
#11 (-)	3.25	3.14	3.14	3.74	3.00	2.86	3.27	3.80	2.79	3.42
#12 (-)	3.26	3.57	3.07	3.50	3.17	3.29	3.27	4.10	2.89	3.00
# 13	2.67	2.29	2.79	2.48	2.95	1.86	2.36	3.00	2.58	3.04
#14 (-)	2.09	2.86	2.13	1.96	1.91	1.57	2.00	1.90	2.21	2.21
# 15	3.17	3.57	3.14	3.04	3.17	3.14	3.45	3.10	3.26	2.96
# 16	3.54	3.29	3.73	2.88	3.48	4.29	4.09	3.50	3.84	3.54
# 17	2.63	2.57	2.60	2.54	2.61	2.71	2.64	2.70	2.95	2.67
# 18	3.31	3.43	3.21	3.25	3.50	3.00	3.73	3.00	3.68	3.46
#19 (-)	2.57	2.71	2.71	2.63	2.59	2.86	2.64	2.56	2.47	2.50
# 20	3.01	2.71	3.57	2.79	2.95	3.00	3.73	3.70	2.63	2.96
#21 (-)	2.83	3.57	3.21	2.57	2.83	2.00	2.64	2.60	2.74	2.75
#22 (-)	3.09	3.86	3.50	3.17	3.04	3.29	2.82	3.33	2.42	3.13
#23 (-)	2.22	2.29	2.43	2.17	2.04	2.50	1.36	2.20	1.94	2.46
#24 (-)	1.99	1.86	2.00	1.82	1.70	2.14	2.27	1.78	1.89	2.04
# 25	3.49	3.57	3.43	3.00	3.43	4.57	4.09	3.60	3.47	3.38
#26 (-)	2.36	3.00	2.71	2.35	2.22	2.14	2.09	2.60	2.47	2.04
# 27	2.90	2.00	3.00	2.78	2.96	3.57	2.73	2.60	3.16	2.88
#28 (-)	2.14	2.57	2.14	1.87	2.09	2.29	2.00	2.50	1.84	1.96
#29 (-)	2.89	2.43	2.64	3.09	2.57	3.00	2.73	3.50	2.47	2.96
#30 (-)	2.46	3.14	2.50	2.35	2.39	2.43	1.70	2.60	2.00	2.38
	N= 185	N= 7	N= 14	N= 24	N= 23	N= 7	N= 11	N= 10	N= 19	N= 24
(-)= "Disagree" means a favourable attitude towards computerization.										

Table 4

ATTITUDES BY EDUCATIONAL LEVEL				
		MEAN SCORES		
QUESTION	BACHELORS	MASTERS	DOCTORAL	ALL CANADA
# 1	4.16	4.22	3.77	3.93
# 2	3.92	4.03	3.62	3.75
# 3	4.03	3.88	3.53	3.68
# 4	2.84	3.05	2.75	2.83
# 5	3.24	3.61	3.28	3.35
# 6	2.45	2.69	2.44	2.50
# 7	3.63	3.51	3.26	3.37
#8 (-)	2.08	2.02	2.31	2.21
#9 (-)	2.39	2.73	2.57	2.58
#10	2.58	2.75	2.32	2.45
#11 (-)	3.21	3.12	3.22	3.20
#12 (-)	3.26	3.32	3.24	3.26
#13	3.08	3.29	2.68	2.87
#14 (-)	1.79	1.83	1.99	1.93
#15	3.34	3.14	3.24	3.23
#16	4.16	4.05	3.64	3.80
#17	2.97	3.03	2.66	2.79
#18	3.37	3.44	3.30	3.34
#19 (-)	2.70	2.38	2.52	2.52
#20	3.25	3.31	2.97	3.08
#21 (-)	2.84	3.02	2.93	2.94
#22 (-)	2.97	3.17	3.05	3.07
#23 (-)	1.92	2.14	2.19	2.14
#24 (-)	2.32	1.97	2.11	2.11
#25	3.74	3.63	3.54	3.59
#26 (-)	2.26	2.20	2.40	2.33
#27	2.87	3.08	2.89	2.93
#28 (-)	2.39	1.90	2.15	2.13
#29 (-)	2.89	2.92	2.86	2.88
#30 (-)	2.35	2.40	2.44	2.42
(-) = "Disagree" means a favourable attitude towards computerization				

Table 5

ATTITUDES BY SIZE OF UNIVERSITY					
		Mean Scores			
QUESTION	VERY LARGE	LARGE	MEDIUM	SMALL	ALL CANADA
# 1	3.81	3.94	3.82	4.29	3.95
# 2	3.74	3.73	3.72	3.92	3.77
# 3	3.62	3.72	3.47	3.92	3.68
# 4	2.89	2.89	2.65	2.89	2.83
# 5	3.26	3.41	3.13	3.58	3.34
# 6	2.52	2.48	2.40	2.57	2.49
# 7	3.43	3.37	3.12	3.60	3.37
#8 (-)	2.35	2.10	2.25	2.11	2.20
#9 (-)	2.51	2.67	2.63	2.45	2.58
#10	2.24	2.46	2.35	2.72	2.44
#11 (-)	3.20	3.20	3.17	3.34	3.22
#12 (-)	3.22	3.22	3.32	3.46	3.30
#13	2.78	2.90	2.73	3.27	2.91
#14 (-)	2.04	1.87	1.99	1.85	1.93
#15	3.15	3.27	3.21	3.31	3.24
#16	3.65	3.79	3.67	4.29	3.83
#17	2.66	2.75	2.83	2.95	2.79
#18	3.64	3.29	3.18	3.42	3.37
#19 (-)	2.43	2.54	2.48	2.49	2.49
#20	3.06	3.21	2.95	3.27	3.12
#21 (-)	2.96	2.85	2.78	3.23	2.94
#22 (-)	3.34	3.05	2.89	3.16	3.10
#23 (-)	2.26	2.04	2.16	2.19	2.15
#24 (-)	2.18	1.95	2.11	2.15	2.08
#25	3.31	3.74	3.36	3.84	3.57
#26 (-)	2.32	2.29	2.31	2.26	2.30
#27	2.87	2.93	2.92	2.83	2.89
#28 (-)	2.01	2.10	2.30	2.08	2.13
#29 (-)	2.69	2.94	3.05	2.91	2.90
#30 (-)	2.31	2.41	2.47	2.33	2.38
(-) = "Disagree" means a favourable attitude towards computerization					
Very Large = more than 3000 faculty					
Large = 1000 to 2999 faculty					
Medium = 200 to 999 faculty					
Small = under 200 faculty					

Appendix I

ATTITUDE SURVEY

University of Regina
Regina, Saskatchewan
S4S 0A2

Please rate the following statements by circling the number that represents the response closest to your opinion.

1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree

1.	Computers help to increase productivity in the educational process.	1 2 3 4 5
2.	Computers can help to achieve a higher quality of learning.	1 2 3 4 5
3.	Computers can help to individualize instruction to better meet the needs of particular students.	1 2 3 4 5
4.	Computers help to lay the foundation of primary and secondary education.	1 2 3 4 5
5.	Computers help to motivate students.	1 2 3 4 5
6.	Computers can prevent social isolation.	1 2 3 4 5
7.	Computers can help weaker students.	1 2 3 4 5
8.	Teaching with computers is too expensive and time consuming to be worth the effort.	1 2 3 4 5
9.	Computers will widen the gap between rural and urban students.	1 2 3 4 5
10.	Computers will reduce differences in the quality of universities.	1 2 3 4 5
11.	There is a lot of politics involved in the introduction of computers in higher education.	1 2 3 4 5
12.	Computerization will disproportionately benefit better funded universities.	1 2 3 4 5
13.	Computers will bring about a pedagogical revolution in higher education.	1 2 3 4 5
14.	Computers are only really useful in science and technical education.	1 2 3 4 5
15.	Computerization generally creates new jobs.	1 2 3 4 5
16.	Computers improve university administration.	1 2 3 4 5
17.	Computerization fosters fair and equitable admission to higher education.	1 2 3 4 5
18.	In education, computers are gender neutral.	1 2 3 4 5
19.	Computers adversely affect students' analytical abilities.	1 2 3 4 5
20.	Computers increase creativity.	1 2 3 4 5
21.	Computers make humans machine dependent.	1 2 3 4 5
22.	Computers widen the gap between rich and poor students.	1 2 3 4 5
23.	Computers are expensive toys.	1 2 3 4 5
24.	The introduction of computers into teaching threatens teachers.	1 2 3 4 5
25.	Computerization makes university administrators' jobs easier.	1 2 3 4 5
26.	Computers threaten workers' health.	1 2 3 4 5
27.	Studying computers will guarantee a higher paying job.	1 2 3 4 5
28.	Computers will widen the gap between men and women.	1 2 3 4 5
29.	Those with power in the university make all major decisions about computers.	1 2 3 4 5
30.	Computerization leads to the loss of jobs.	1 2 3 4 5

Appendix II

ATTITUDE SURVEY RESULTS

Frequency Distribution Percentages

QUESTION		ST DISAGREE	DISAGREE	UNDECIDED	AGREE	ST AGREE	MEAN	N
# 1	Computers help to increase productivity in the educational process.							
	ALL FACULTY	2.2	9.3	23.6	47.3	17.6	3.69	182
	DEANS	2.6	2.6	5.1	51.3	38.5	4.21	39
	ADMISSIONS	0	0	5.3	42.1	52.6	4.47	19
	REGISTRARS	0	0	9.7	35.5	54.8	4.45	31
	COM. CENTRE	0	0	18.2	72.7	9.1	3.91	11
	OTHER ADMIN	0	0	3.8	46.2	50	4.46	26
	ALL ADMIN	0.8	0.8	7.1	46.8	44.4	4.33	126
	ALL CANADA	1.6	5.8	16.9	47.1	28.6	3.95	308
# 2	Computers can help to achieve a higher quality of learning.							
	ALL FACULTY	3.8	8.7	27.7	45.7	14.1	3.58	184
	DEANS	0	2.6	20.5	53.8	23.1	3.97	39
	ADMISSIONS	0	5.3	31.6	47.4	15.8	3.74	19
	REGISTRARS	0	3.2	12.9	48.4	35.5	4.16	31
	COM. CENTRE	0	0	36.4	54.5	9.1	3.73	11
	OTHER ADMIN	0	0	11.5	42.3	46.2	4.35	26
	ALL ADMIN	0	2.4	19.8	49.2	28.6	4.04	126
	ALL CANADA	2.3	6.1	24.5	47.1	20	3.77	310
# 3	Computers can help to individualize instruction to better meet the needs of particular students.							
	ALL FACULTY	2.7	14.1	30.8	36.2	16.2	3.49	185
	DEANS	0	0	16.2	59.5	24.3	4.08	37
	ADMISSIONS	0	10.5	26.3	42.1	21.1	3.74	19
	REGISTRARS	0	0	26.7	50	23.3	3.97	30
	COM. CENTRE	0	0	36.4	54.5	9.1	3.73	11
	OTHER ADMIN	0	0	26.9	46.2	26.9	4.00	26
	ALL ADMIN	0	1.6	24.4	51.2	22.8	3.95	123
	ALL CANADA	1.6	9.1	28.2	42.2	18.8	3.68	308
# 4	Computers help to lay the foundation of primary and secondary education.							
	ALL FACULTY	14.1	22.9	36.5	16.7	4.7	2.74	182
	DEANS	10.5	13.2	36.8	28.9	10.5	3.16	38
	ADMISSIONS	10.5	31.6	31.6	15.8	10.5	2.84	19
	REGISTRARS	10.3	31	37.9	13.8	6.9	2.76	29
	COM. CENTRE	9.1	45.5	27.3	9.1	9.1	2.64	11
	OTHER ADMIN	8	8	56	20	8	3.12	25
	ALL ADMIN	9.8	2.1	39.3	19.7	9	2.96	122
	ALL CANADA	12.8	23.4	38.8	18.4	6.6	2.83	304

# 5	Computers help to motivate students.							
	ALL FACULTY	3.8	16.1	34.9	41.4	3.8	3.25	186
	DEANS	2.6	7.9	36.8	47.4	5.3	3.45	38
	ADMISSIONS	0	5.6	44.4	50	0	3.44	18
	REGISTRARS	0	10	40	40	10	3.50	30
	COM. CENTRE	9.1	0	63.6	27.3	0	3.09	11
	OTHER ADMIN	0	8	32	44	16	3.68	25
	ALL ADMIN	1.6	7.4	40.2	43.4	7.4	3.48	122
	ALL CANADA	2.9	12.7	37	42.2	5.2	3.34	308
# 6	Computers can prevent social isolation.							
	ALL FACULTY	18.1	33.5	37.4	8.8	2.2	2.43	182
	DEANS	16.2	24.3	43.2	13.5	2.7	2.62	37
	ADMISSIONS	15.8	42.1	36.8	5.3	0	2.32	19
	REGISTRARS	3.3	46.7	33.3	16.7	0	2.63	30
	COM. CENTRE	18.2	45.5	9.1	27.3	0	2.46	11
	OTHER ADMIN	8	32	48	12	0	2.64	25
	ALL ADMIN	11.5	36.1	37.7	13.9	0.8	2.57	122
	ALL CANADA	15.5	34.5	37.5	10.9	1.6	2.49	304
# 7	Computers can help weaker students.							
	ALL FACULTY	4.9	14.8	37.2	37.7	5.5	3.24	183
	DEANS	0	10.8	29.7	51.4	8.1	3.57	37
	ADMISSIONS	10.5	5.3	26.3	52.6	5.3	3.37	19
	REGISTRARS	3.3	3.3	36.7	46.7	10	3.57	30
	COM. CENTRE	0	9.1	36.4	45.5	9.1	3.55	11
	OTHER ADMIN	0	8	36	36	20	3.68	25
	ALL ADMIN	2.5	7.4	32.8	46.7	10.7	3.56	122
	ALL CANADA	3.9	11.8	35.4	41.3	7.5	3.37	305
# 8	Teaching with computers is too expensive and time consuming to be worth the effort.							
	ALL FACULTY	19.7	41	29.5	7.7	2.2	2.32	183
	DEANS	34.2	47.4	13.2	0	5.3	1.95	38
	ADMISSIONS	21.1	42.1	31.6	5.3	0	2.21	19
	REGISTRARS	27.6	51.7	13.8	6.9	0	2.00	29
	COM. CENTRE	27.3	45.5	27.3	0	0	2.00	11
	OTHER ADMIN	15.4	65.4	19.2	0	0	2.04	26
	ALL ADMIN	26	51.2	18.7	2.4	1.6	2.02	123
	ALL CANADA	22.2	45.1	25.2	5.6	2	2.20	306
# 9	Computers will widen the gap between rural and urban students.							
	ALL FACULTY	12.5	38.6	29.9	14.7	4.3	2.60	184
	DEANS	18.4	31.6	42.1	7.9	0	2.40	38
	ADMISSIONS	10.5	31.6	31.6	21.1	5.3	2.79	19
	REGISTRARS	22.6	29	25.8	19.4	3.2	2.52	31
	COM. CENTRE	0	54.5	45.5	0	0	2.46	11
	OTHER ADMIN	7.7	42.3	30.8	11.5	7.7	2.69	26
	ALL ADMIN	14.4	35.2	34.4	12.8	3.2	2.55	125
	ALL CANADA	13.3	37.2	31.7	13.9	3.9	2.58	309

#10	Computers will reduce the differences in the quality of universities.							
	ALL FACULTY	17.9	42.9	26.6	10.9	1.6	2.35	184
	DEANS	23.7	18.4	42.1	15.8	0	2.50	38
	ADMISSIONS	15.8	31.6	42.1	10.5	0	2.47	19
	REGISTRARS	10	40	26.7	20	3.3	2.67	30
	COM. CENTRE	9.1	63.6	18.2	9.1	0	2.27	11
	OTHER ADMIN	7.7	30.8	42.3	19.2	0	2.73	26
	ALL ADMIN	14.5	32.3	36.3	16.1	0.8	2.57	124
	ALL CANADA	16.6	38.6	30.5	13	1.3	2.44	308
#11	There is a lot of politics involved in the introduction of computers in higher education.							
	ALL FACULTY	3.9	21.5	32	30.4	12.2	3.25	181
	DEANS	7.9	28.9	26.3	28.9	7.9	3.00	38
	ADMISSIONS	0	42.1	26.3	26.3	5.3	2.95	19
	REGISTRARS	6.9	27.6	20.7	34.5	10.3	3.14	29
	COM. CENTRE	0	0	27.3	63.6	9.1	3.82	11
	OTHER ADMIN	3.8	19.2	19.2	46.2	11.5	3.42	26
	ALL ADMIN	4.9	26	23.6	36.6	8.9	3.19	123
	ALL CANADA	4.3	23.4	28.6	32.9	10.9	3.23	304
#12	Computerization will disproportionately benefit better funded universities.							
	ALL FACULTY	4.3	21.7	27.2	37.5	9.2	3.26	184
	DEANS	2.6	15.8	36.8	36.8	7.9	3.32	38
	ADMISSIONS	0	26.3	36.8	36.8	0	3.11	19
	REGISTRARS	3.2	19.4	19.4	48.4	9.7	3.42	31
	COM. CENTRE	0	0	18.2	72.7	9.1	3.91	11
	OTHER ADMIN	0	23.1	30.8	38.5	7.7	3.31	26
	ALL ADMIN	1.6	18.4	29.6	43.2	7.2	3.36	125
	ALL CANADA	3.2	20.4	28.2	39.8	8.4	3.30	309
#13	Computers will bring about a pedagogical revolution in higher education.							
	ALL FACULTY	12.1	31.9	35.7	17.6	2.7	2.67	182
	DEANS	8.1	10.8	48.6	32.4	0	3.05	37
	ADMISSIONS	0	27.8	33.3	33.3	5.6	3.17	18
	REGISTRARS	0	10	43.3	43.3	3.3	3.40	30
	COM. CENTRE	0	0	72.7	27.3	0	3.27	11
	OTHER ADMIN	0	7.7	46.2	34.6	11.5	3.50	26
	ALL ADMIN	2.5	11.5	46.7	35.2	4.1	3.27	122
	ALL CANADA	8.2	23.7	40.1	24.7	3.3	2.91	304
#14	Computers are only really useful in science education.							
	ALL FACULTY	24.9	53	13	7	2.2	2.09	185
	DEANS	36.8	55.3	2.6	2.6	2.6	1.79	38
	ADMISSIONS	42.1	36.8	10.5	10.5	0	1.90	19
	REGISTRARS	46.7	50	0	3.3	0	1.60	30
	COM. CENTRE	45.5	45.5	9.1	0	0	1.64	11
	OTHER ADMIN	46.2	53.8	0	0	0	1.54	26
	ALL ADMIN	42.7	50	3.2	3.2	0.8	1.69	124
	ALL CANADA	32	51.8	9.1	5.5	1.6	1.93	309

#15	Computerization generally creates new jobs.							
	ALL FACULTY	6	13.1	42.1	35.5	3.3	3.17	183
	DEANS	2.6	7.7	28.2	51.3	10.3	3.59	39
	ADMISSIONS	5.3	26.3	31.6	31.6	5.3	3.05	19
	REGISTRARS	0	26.7	16.7	53.3	3.3	3.33	30
	COM. CENTRE	0	9.1	36.4	54.5	0	3.46	11
	OTHER ADMIN	0	23.1	42.3	30.8	3.8	3.15	26
	ALL ADMIN	1.6	18.4	29.6	44.8	5.6	3.34	125
	ALL CANADA	4.2	15.3	37	39.3	4.2	3.24	308
#16	Computers improve university administration.							
	ALL FACULTY	7.6	10.9	20.7	41.8	19	3.54	184
	DEANS	0	5.3	7.9	55.3	31.6	4.13	38
	ADMISSIONS	0	5.3	0	36.8	57.9	4.47	19
	REGISTRARS	0	3.4	3.4	44.8	48.3	4.38	29
	COM. CENTRE	0	0	18.2	63.6	18.2	4.00	11
	OTHER ADMIN	0	3.8	7.7	46.2	42.3	4.27	26
	ALL ADMIN	0	4.1	6.5	48.8	40.7	4.26	123
	ALL CANADA	4.6	8.1	15	44.6	27.7	3.83	307
#17	Computerization fosters fair and equitable admission to higher education.							
	ALL FACULTY	10.4	29	49.2	10.4	1.1	2.63	183
	DEANS	10.5	13.2	42.1	28.9	5.3	3.05	38
	ADMISSIONS	0	31.6	15.8	47.4	5.3	3.26	19
	REGISTRARS	6.7	26.7	26.7	40	0	3.00	30
	COM. CENTRE	0	27.3	63.6	9.1	0	2.82	11
	OTHER ADMIN	0	24	60	12	4	2.96	25
	ALL ADMIN	4.9	22.8	39.8	29.3	3.3	3.03	123
	ALL CANADA	8.2	26.5	45.4	18	2	2.79	306
#18	In education, computers are gender neutral.							
	ALL FACULTY	6.1	12.2	36.5	35.4	9.9	3.31	181
	DEANS	2.8	8.3	33.3	47.2	8.3	3.50	36
	ADMISSIONS	5.6	11.1	44.4	33.3	5.6	3.22	18
	REGISTRARS	6.5	9.7	35.5	41.9	6.5	3.32	31
	COM. CENTRE	0	0	27.3	63.6	9.1	3.82	11
	OTHER ADMIN	4	0	40	48	8	3.56	25
	ALL ADMIN	4.1	6.6	36.4	45.5	7.4	3.46	121
	ALL CANADA	5.3	9.9	36.4	39.4	8.9	3.37	302
#19	Computers adversly affect students' analytical abilities.							
	ALL FACULTY	16	35.9	28.7	13.3	6.1	2.58	181
	DEANS	13.2	44.7	18.4	18.4	5.3	2.58	38
	ADMISSIONS	10.5	57.9	26.3	0	5.3	2.32	19
	REGISTRARS	20.7	31	27.6	17.2	3.4	2.52	29
	COM. CENTRE	9.1	63.6	18.2	9.1	0	2.18	11
	OTHER ADMIN	15.4	61.5	19.2	3.8	0	2.12	26
	ALL ADMIN	13.8	48.8	22	11.4	3.3	2.39	123
	ALL CANADA	15.1	41.1	26	12.5	4.9	2.50	304

#20	Computers increase creativity.							
	ALL FACULTY	7.6	23.4	36.4	26.1	6.5	3.01	184
	DEANS	2.6	10.5	55.3	31.6	0	3.16	38
	ADMISSIONS	0	11.1	44.4	38.9	5.6	3.39	18
	REGISTRARS	0	13.8	31	55.2	0	3.41	29
	COM. CENTRE	9.1	9.1	63.6	18.2	0	2.91	11
	OTHER ADMIN	0	7.7	46.2	38.5	7.7	3.46	26
	ALL ADMIN	1.6	10.7	46.7	38.5	2.5	3.30	122
	ALL CANADA	5.2	18.3	40.5	31	4.9	3.12	306
#21	Computers make humans machine dependent.							
	ALL FACULTY	8.2	38.6	18.5	32.1	2.7	2.83	184
	DEANS	7.9	23.7	15.8	44.7	7.9	3.21	38
	ADMISSIONS	21.1	21.1	15.8	42.1	0	2.79	19
	REGISTRARS	6.9	24.1	10.3	58.6	0	3.21	29
	COM. CENTRE	9.1	18.2	27.3	45.5	0	3.09	11
	OTHER ADMIN	0	42.3	11.5	42.3	3.8	3.08	26
	ALL ADMIN	8.1	26.8	14.6	47.2	3.3	3.11	123
	ALL CANADA	8.1	33.9	16.9	38.1	2.9	2.94	307
#22	Computers widen the gap between rich and poor students.							
	ALL FACULTY	5.5	27.1	28.7	29.8	8.8	3.09	181
	DEANS	5.4	18.9	37.8	35.1	2.7	3.11	37
	ADMISSIONS	10.5	31.6	31.6	21.1	5.3	2.79	19
	REGISTRARS	0	29	32.3	25.8	12.9	3.23	31
	COM. CENTRE	0	9.1	36.4	54.5	0	3.46	11
	OTHER ADMIN	3.8	30.8	34.6	26.9	3.8	2.96	26
	ALL ADMIN	4	25	34.7	30.6	5.6	3.09	124
	ALL CANADA	4.9	26.2	31.1	30.2	7.5	3.09	305
#23	Computers are expensive toys.							
	ALL FACULTY	28.2	42	12.2	15.5	2.2	2.22	181
	DEANS	29.7	56.8	5.4	8.1	0	1.92	37
	ADMISSIONS	42.1	42.1	10.5	5.3	0	1.79	19
	REGISTRARS	25	42.9	10.7	7.1	14.3	2.43	28
	COM. CENTRE	36.4	36.4	18.2	0	9.1	2.09	11
	OTHER ADMIN	23.1	57.7	7.7	1.5	0	2.08	26
	ALL ADMIN	29.8	49.6	9.1	7.4	4.1	2.07	121
	ALL CANADA	28.8	45	10.9	12.3	3	2.16	302
#24	The introduction of computers into teaching threatens teachers.							
	ALL FACULTY	30.9	50.8	8.8	7.2	2.2	1.99	181
	DEANS	23.7	42.1	10.5	21.1	2.6	2.37	38
	ADMISSIONS	21.1	47.4	15.8	15.8	0	2.26	19
	REGISTRARS	26.7	50	10	13.3	0	2.10	30
	COM. CENTRE	40	40	10	10	0	1.90	10
	OTHER ADMIN	15.4	57.7	15.4	11.5	0	2.23	26
	ALL ADMIN	23.6	48	12.2	15.4	0.8	2.22	123
	ALL CANADA	28	49.7	10.2	10.5	1.6	2.08	304

#25	Computerization makes university administrator's jobs easier.							
	ALL FACULTY	4.9	15.8	19.7	44.3	15.3	3.49	183
	DEANS	2.6	15.8	13.2	42.1	26.3	3.74	38
	ADMISSIONS	0	10.5	0	57.9	31.6	4.11	19
	REGISTRARS	7.4	22.2	11.1	18.5	40.7	3.63	27
	COM. CENTRE	0	45.5	9.1	27.3	18.2	3.18	11
	OTHER ADMIN	0	19.2	15.4	46.2	19.2	3.65	26
	ALL ADMIN	2.5	19.8	10.7	38.8	28.1	3.70	121
	ALL CANADA	3.9	17.4	16.1	42.1	20.4	3.58	304
#26	Computers threaten workers health.							
	ALL FACULTY	23	33.3	31.1	9.8	2.7	2.36	183
	DEANS	18.4	36.8	31.6	13.2	0	2.40	38
	ADMISSIONS	15.8	52.6	26.3	5.3	0	2.21	19
	REGISTRARS	20	50	26.7	3.3	0	2.13	30
	COM. CENTRE	36.4	27.3	27.3	9.1	0	2.09	11
	OTHER ADMIN	30.8	42.3	23.1	3.8	0	2.00	26
	ALL ADMIN	22.6	42.7	27.4	7.3	0	2.19	124
	ALL CANADA	22.8	37.1	29.6	8.8	1.6	2.29	307
#27	Studying computers will guarantee a higher paying job.							
	ALL FACULTY	7.6	29.9	32.6	25	4.9	2.90	184
	DEANS	5.3	39.5	15.8	34.2	5.3	2.95	38
	ADMISSIONS	10.5	36.8	10.5	42.1	0	2.84	19
	REGISTRARS	0	36.7	33.3	30	0	2.93	30
	COM. CENTRE	18.2	54.5	9.1	18.2	0	2.27	11
	OTHER ADMIN	11.5	15.4	38.5	30.8	3.8	3.00	26
	ALL ADMIN	7.3	34.7	23.4	32.3	2.4	2.88	124
	ALL CANADA	7.5	31.8	28.9	27.9	3.9	2.89	308
#28	Computers will widen the gap between men and women.							
	ALL FACULTY	25.1	44.3	25.1	2.7	2.7	2.14	183
	DEANS	16.2	62.2	10.8	10.8	0	2.16	37
	ADMISSIONS	26.3	52.6	15.8	5.3	0	2.00	19
	REGISTRARS	20	50	20	3.3	6.7	2.27	30
	COM. CENTRE	27.3	45.5	18.2	9.1	0	2.09	11
	OTHER ADMIN	26.9	50	23.1	0	0	1.96	26
	ALL ADMIN	22	53.7	17.1	5.7	1.6	2.11	123
	ALL CANADA	23.9	48	21.9	3.9	2.3	2.13	306
#29	Those with power in the university make all major decisions about computers.							
	ALL FACULTY	10.5	34.8	18.8	27.1	8.8	2.89	181
	DEANS	2.6	39.5	15.8	31.6	10.5	3.08	38
	ADMISSIONS	5.6	33.3	16.7	44.4	0	3.00	18
	REGISTRARS	9.7	38.7	0	38.7	12.9	3.07	31
	COM. CENTRE	9.1	27.3	9.1	54.5	0	3.09	11
	OTHER ADMIN	11.5	50	15.4	19.2	3.8	2.54	26
	ALL ADMIN	7.3	39.5	11.3	34.7	7.3	2.95	124
	ALL CANADA	9.2	36.7	15.7	30.2	8.2	2.92	305

#30	Computerization leads to the loss of jobs.							
	ALL FACULTY	15.6	38.9	32.2	10.6	2.8	2.46	180
	DEANS	21.1	52.6	21.1	5.3	0	2.11	38
	ADMISSIONS	5.6	44.4	33.3	16.7	0	2.61	18
	REGISTRARS	3.4	69	13.8	13.8	0	2.38	29
	COM. CENTRE	9.1	63.6	27.3	0	0	2.18	11
	OTHER ADMIN	23.1	53.8	11.5	7.7	3.8	2.15	26
	ALL ADMIN	13.9	56.6	19.7	9	0.8	2.26	122
	ALL CANADA	14.9	46	27.2	9.9	2	2.38	302